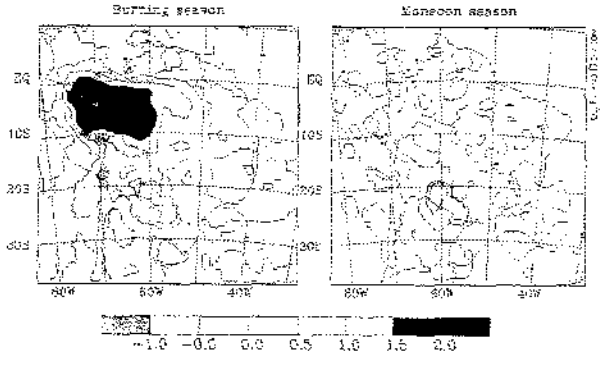
tions and clouds, and its contribution to the interannual change of the South American monsoon onset.—YONGQIANG LIU (USDA FOREST SERVICE), R. FU, AND R. DICKINSON. *"The Impacts of Smoke Aerosols on South American Monsoon." Atmospheric Sciences and Air Quality Conference, 27–29 April 2005, San Francisco, California.*

Smoke Aerosols Altering South American Monsoon

Biomass burning has been extensively used in the past two decades to clear forest and savanna for agricultural use in tropical South America. Recently, the influence of smoke aerosols on the microphysical properties of clouds and convection has been extensively reported. For the first time, research suggests that biomass-burning aerosols, peaking shortly before the onset of the South American monsoon, may influence the development of the monsoon.



Perturbation in the 500-hPa geopotential height (m) induced by smoke aerosols in 1995, simulated with

This result was simulated for the period August–November 1995 using the NCAR regional climate the smoke aerosol radiative forcing obtained from the Smoke, Clouds, and Radiation–Brazil field measurement. The smoke aerosol influence is determined by comparing this simulation with another simulation without forcing by smoke aerosols for the same period and atmospheric conditions. The comparison suggests that smoke aerosols may strengthen the dry season circulation pattern by stabilizing the lower troposphere—precipitation decreases accordingly. The perturbation signals initially induced by smoke aerosols could last into the subsequent monsoon season. Thus, the effect of smoke aerosols could be to weaken and delay the transition of large-scale circulation into the monsoon season.

Using the aerosol and cloud data from the *Terra* and *Aqua* satellites of the NASA Earth Observing System for 2002 and 2003, we have observed that surface cooling due to smoke aerosols could either be offset by a decrease in clouds when the atmosphere is abnormally dry and stable, or it could be amplified by an increase in cloud brightness when the atmosphere is humid and less stable. Thus, it is important for us to understand the interaction between smoke aerosols, atmo-

tions and clouds, and its contribution to the interannual change of the South American monsoon onset.—YONGQIANG LIU (USDA FOREST SERVICE), R. FU, AND R. DICKINSON. *"The Impacts of Smoke Aerosols on South American Monsoon." Atmospheric Sciences and Air Quality Conference, 27–29 April 2005, San Francisco, California.*